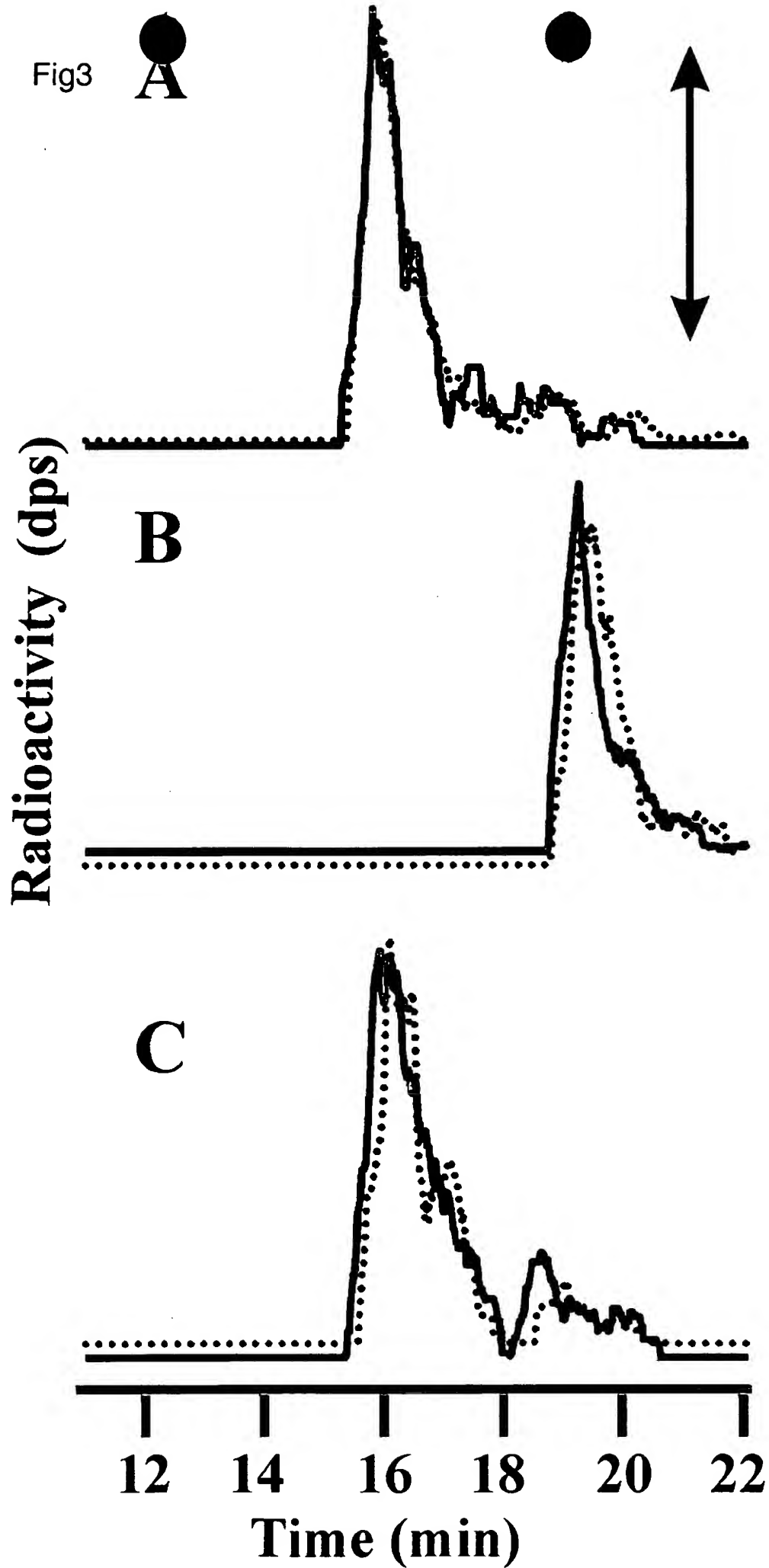FIG. 1

```
            1                                                    50
      PmCS  MNTLSQAIKA YNSNDYELAL KLFEKSAETY GRKIVEFQII KCKEKLSTNS
     PmHAS  MNTLSQAIKA YNSNDYQLAL KLFEKSAEIY GRKIVEFQIT KCKEKLSAHP
 Consensus  MNTLSQAIKA YNSNDY#LAL KLFEKSAEiY GRKIVEFQIi KCKEKLSanp

            51                                                   100
      PmCS  YVS....... EDKKNSVCDS SLDIATQLLL SNVKKLTLSE SEKNSLKNKW
     PmHAS  SVNSAHLSVN KEEKVNVCDS PLDIATQLLL SNVKKLVLSD SEKNTLKNKW
 Consensus  sVn....... e#eKnnVCDS pLDIATQLLL SNVKKLtLS# SEKNsLKNKW

            101                                                  150
      PmCS  KSITGKKSEN AEIRKVELVP KDFPKDLVLA PLPDHVNDFT WYKNRKKSLG
     PmHAS  KLLTEKKSEN AEVRAVALVP KDFPKDLVLA PLPDHVNDFT WYKKRKKRLG
 Consensus  KliTeKKSEN AE!RaVaLVP KDFPKDLVLA PLPDHVNDFT WYKnRKKrLG

            151                                                  200
      PmCS  IKPVNKNIGL SIIIPTFNRS RILDITLACL VNQKTNYPFE VVVADDGSKE
     PmHAS  IKPEHQHVGL SIIVTTFNRP AILSITLACL VNQKTHYPFE VIVTDDGSQE
 Consensus  IKPenqn!GL SII!pTFNRp aILdITLACL VNQKTnYPFE V!VaDDGSqE

            201                                                  250
      PmCS  NLLTIVQKYE QKLDIKYVRQ KDYGYQLCAV RNLGLRTAKY DFVSILDCDM
     PmHAS  DLSPIIRQYE NKLDIRYVRQ KDNGFQASAA RNMGLRLAKY DFIGLLDCDM
 Consensus  #LlpI!rqYE #KLDIrYVRQ KDnG%QacAa RN$GLRlAKY DF!giLDCDM

            251                                                  300
      PmCS  APQQLWVHSY LTELLEDNDI VLIGPRKYVD THNITAEQFL NDPYLIESLP
     PmHAS  APNPLWVHSY VAELLEDDDL TIIGPRKYID TQHIDPKDFL NNASLLESLP
 Consensus  AP#qLWVHSY laELLED#Di tiIGPRKY!D TqnIdae#FL N#asLiESLP

            301                                                  350
      PmCS  ETATNNNPSI TSKGNISLDW RLEHFKKTDN LRLCDSPFRY FSCGNVAFSK
     PmHAS  EVKTNNSVAA KGEGTVSLDW RLEQFEKTEN LRLSDSPFRF FAAGNVAFAK
 Consensus  EtaTNNnpaa kgeGn!SLDW RLEqFeKT#N LRLCDSPFR% FaaGNVAFaK

            351                                                  400
      PmCS  EWLNKVGWFD EEFNHWGGED VEFGYRLFAK GCFFRVIDGG MAYHQEPPGK
     PmHAS  KWLNKSGFFD EEFNHWGGED VEFGYRLFRY GSFFKTIDGI MAYHQEPPGK
 Consensus  eWLNKsGfFD EEFNHWGGED VEFGYRLFak GcFFrtIDGg MAYHQEPPGK

            401                                                  450
      PmCS  ENETDREAGK SITLKIVKEK VPYIYRKLLP IEDSHIHRIP LVSIYIPAYN
     PmHAS  ENETDREAGK NITLDIMREK VPYIYRKLLP IEDSHINRVP LVSIYIPAYN
 Consensus  ENETDREAGK nITLdImrEK VPYIYRKLLP IEDSHInR!P LVSIYIPAYN

            451                                                  500
      PmCS  CANYIQRCVD SALNQTVVDL EVCICNDGST DNTLEVINKL YGNNPRVRIM
     PmHAS  CANYIQRCVD SALNQTVVDL EVCICNDGST DNTLEVINKL YGNNPRVRIM
 Consensus  CANYIQRCVD SALNQTVVDL EVCICNDGST DNTLEVINKL YGNNPRVRIM

            501                                                  550
      PmCS  SKPNGGIASA SNAAVSFAKG YYIGQLDSDD YLEPDAVELC LKEFLKDKTL
     PmHAS  SKPNGGIASA SNAAVSFAKG YYIGQLDSDD YLEPDAVELC LKEFLKDKTL
 Consensus  SKPNGGIASA SNAAVSFAKG YYIGQLDSDD YLEPDAVELC LKEFLKDKTL

            551                                                  600
      PmCS  ACVYTTNRNV NPDGSLIANG YNWPEFSREK LTTAMIAHHF RMFTIRAWHL
     PmHAS  ACVYTTNRNV NPDGSLIANG YNWPEFSREK LTTAMIAHHF RMFTIRAWHL
 Consensus  ACVYTTNRNV NPDGSLIANG YNWPEFSREK LTTAMIAHHF RMFTIRAWHL
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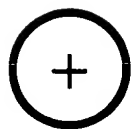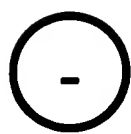
FIG. 1 CONT'D.

```
                601                                                      650
       PmCS     TDGFNENIEN AVDYDMFLKL SEVGKFKHLN KICYNRVLHG DNTSIKKLGI
      PmHAS     TDGFNEKIEN AVDYDMFLKL SEVGKFKHLN KICYNRVLHG DNTSIKKLGI
   Consensus    TDGFNEnIEN AVDYDMFLKL SEVGKFKHLN KICYNRVLHG DNTSIKKLGI

                651                                                      700
       PmCS     QKKNHFVVVN QSLNRQGINY YNYDKFDDLD ESRKYIFNKT AEYQEEMDIL
      PmHAS     QKKNHFVVVN QSLNRQGITY YNYDEFDDLD ESRKYIFNKT AEYQEEIDIL
   Consensus    QKKNHFVVVN QSLNRQGInY YNYDeFDDLD ESRKYIFNKT AEYQEEiDIL

                701                                                      750
       PmCS     KDLKLIQNKD AKIAVSIFYP NTLNGLVKKL NNIIEYNKNI FVIILHVDKN
      PmHAS     KDIKIIQNKD AKIAVSIFYP NTLNGLVKKL NNIIEYNKNI FVIVLHVDKN
   Consensus    KDiKiIQNKD AKIAVSIFYP NTLNGLVKKL NNIIEYNKNI FVI!LHVDKN

                751                                                      800
       PmCS     HLTPDIKKEI LAFYHKHQVN ILLNNDISYY TSNRLIKTEA HLSNINKLSQ
      PmHAS     HLTPDIKKEI LAFYHKHQVN ILLNNDISYY TSNRLIKTEA HLSNINKLSQ
   Consensus    HLTPDIKKEI LAFYHKHQVN ILLNNDISYY TSNRLIKTEA HLSNINKLSQ

                801                                                      850
       PmCS     LNLNCEYIIF DNHDSLFVKN DSYAYMKKYD VGMNFSALTH DWIEKINAHP
      PmHAS     LNLNCEYIIF DNHDSLFVKN DSYAYMKKYD VGMNFSALTH DWIEKINAHP
   Consensus    LNLNCEYIIF DNHDSLFVKN DSYAYMKKYD VGMNFSALTH DWIEKINAHP

                851                                                      900
       PmCS     PFKKLIKTYF NDNDLRSMNV KGASQGMFMK YALPHELLTI IKEVITSCQS
      PmHAS     PFKKLIKTYF NDNDLKSMNV KGASQGMFMT YALAHELLTI IKEVITSCQS
   Consensus    PFKKLIKTYF NDNDLrSMNV KGASQGMFMk YALaHELLTI IKEVITSCQS

                901                                                      950
       PmCS     IDSVPEYNTE DIWFQFALLI LEKKTGHVFN KTSTLTYMPW ERKLQWTNEQ
      PmHAS     IDSVPEYNTE DIWFQFALLI LEKKTGHVFN KTSTLTYMPW ERKLQWTNEQ
   Consensus    IDSVPEYNTE DIWFQFALLI LEKKTGHVFN KTSTLTYMPW ERKLQWTNEQ

                951                    972
       PmCS     IQSAKKGENI PVNKFIINSI TL
      PmHAS     IESAKRGENI PVNKFIINSI TL
   Consensus    I#SAKrGENI PVNKFIINSI TL
```

Fig3

Radioactivity (dps)

A

B

C

12   14   16   18   20   22

Time (min)

Type F

HA
Type III

Chon SO4
heparin

kb ladder
Lambda H

kb

23

6

3

2

Fig 4.

DEANGELIS STD. 5NMOL 10/15/00   Standard

Rha 5nmol
GalNAc 5nmol
GlcNAc 5nmol
Gradient Spike
GlcA

SAMPLE F REPEAT 5NMOL 10/15   Pasteurella Chondroitin

Rha 5nmol
GalNAc
Gradient Spike
GlcA
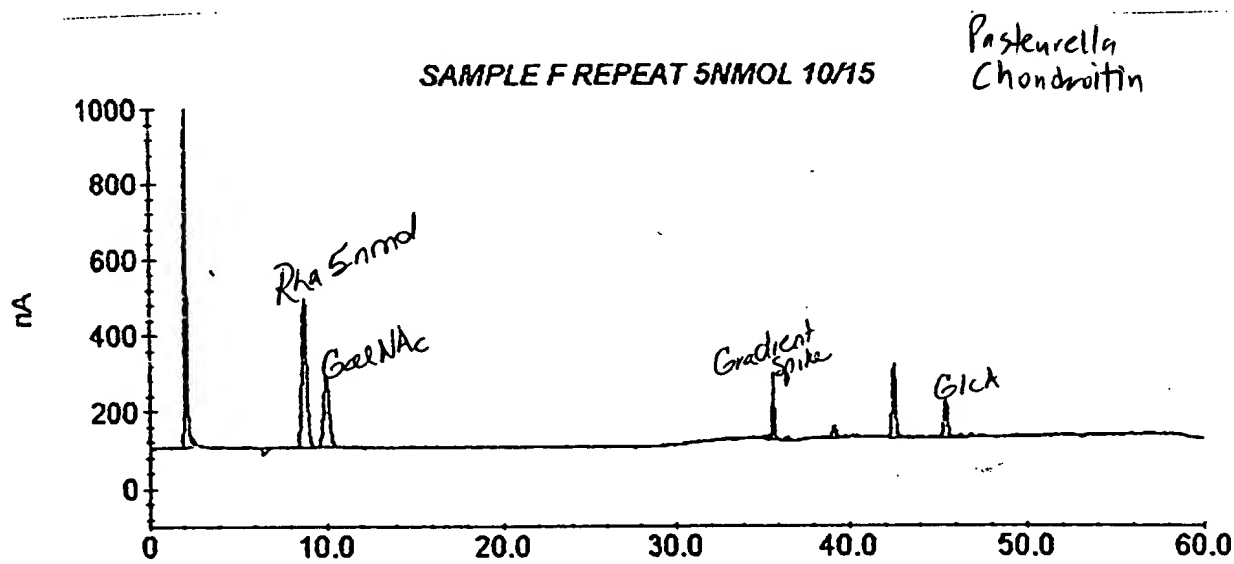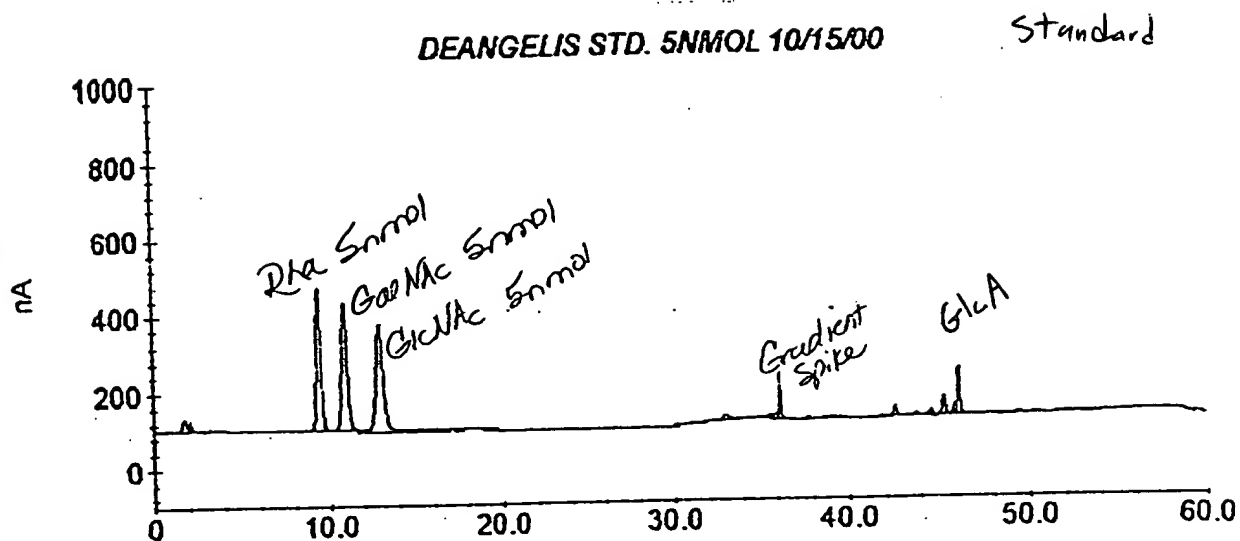
Fig. 5

HA Product Size (5 min assay)

———	W.T.
··········	S77F
———	S77T
———	S77I

DPS

Time (min)

FIG. 6
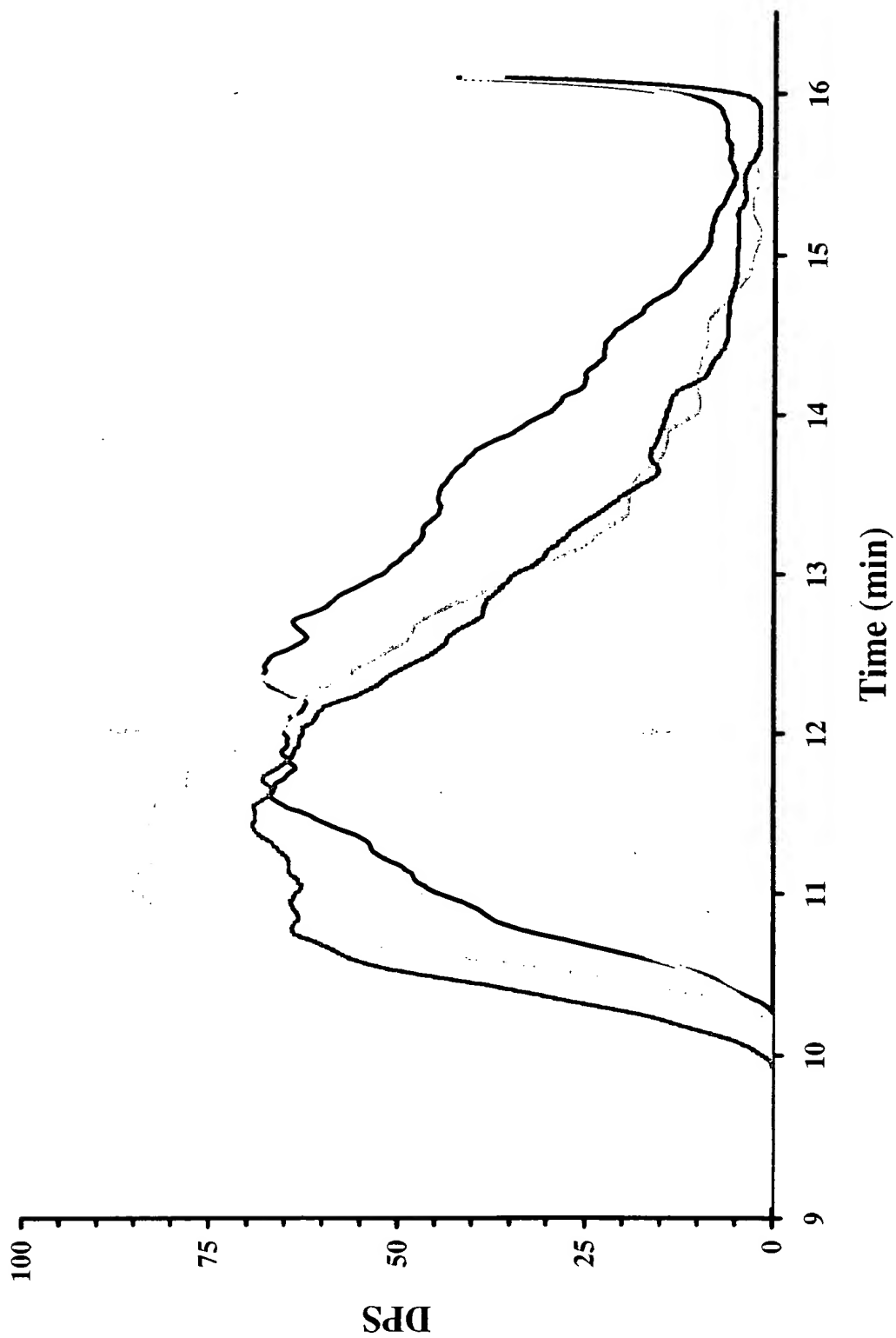
HA Product Size (30 min assay)
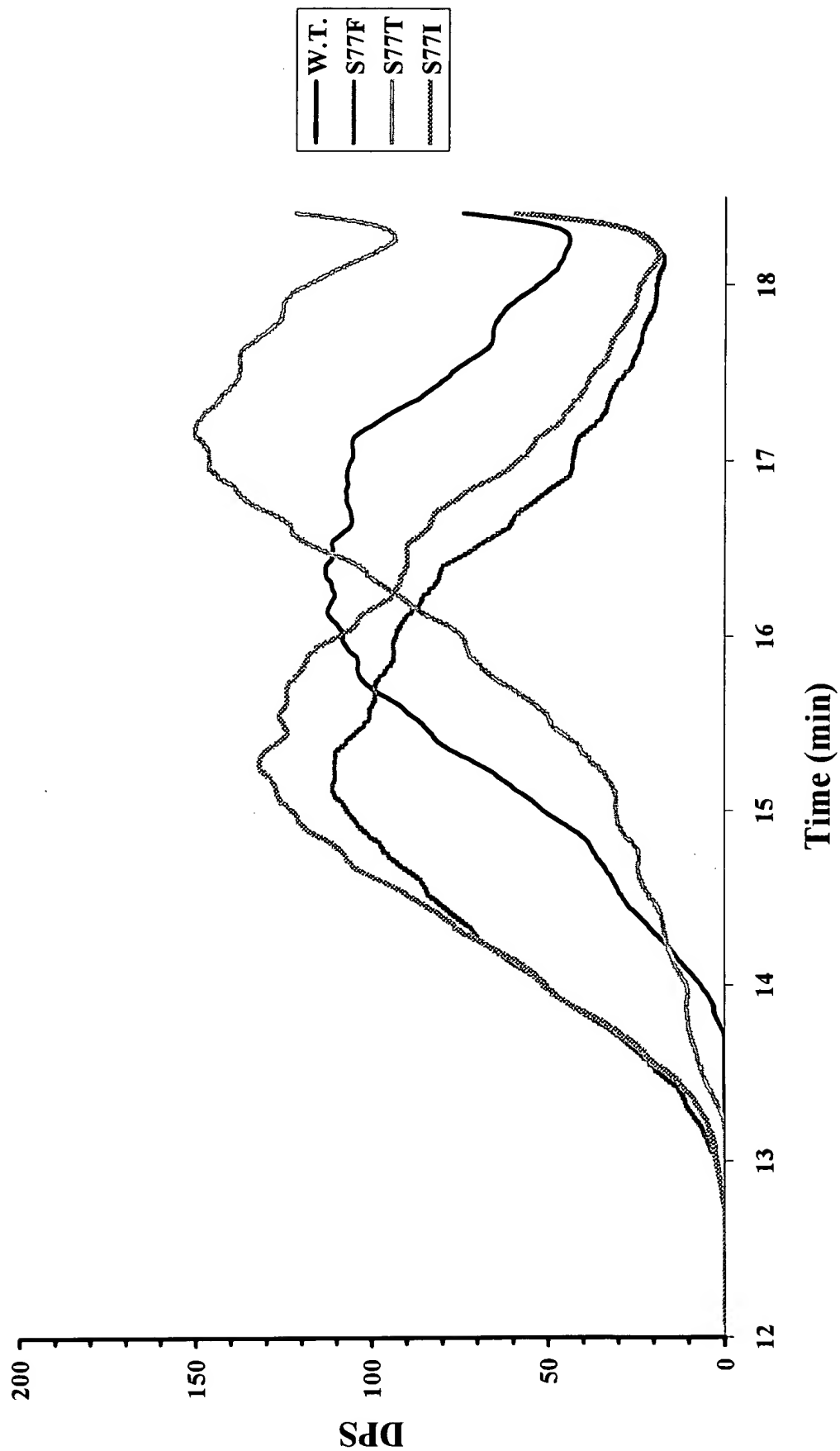
Fig. 7

NMR of Type F Polymer

ppm

Fig. 8

en largedf

Ab case Treshold

ΔDi 05

minutes

Fig.9

Fig. 10